

PATENT
Attorney Docket No. 401584/Aoyama

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

MAEDA et al.

Application No. Unassigned

Art Unit: Unassigned

Filed: February 25, 2002

Examiner: Unassigned

For: AUTHENTICATION-
SELECTION SYSTEM,
AND AUTHENTICA-
TION SYSTEM

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D. C. 20231

Dear Sir:

Prior to the examination of the above-identified patent application, please enter the following amendments and consider the following remarks.

IN THE SPECIFICATION:

Replace the paragraph beginning at page 1, line 8, with:

There have been various methods for security protection of important confidential matters by limiting the number of persons with access to these matters, and for checking persons entering a specific room. For example, use of an IC card, or input of an ID, a password and so on have been used as a method for the authentication. However, the IC card, the ID, the password, and so on are not suitably

used for more strict security protection, as even other persons, except the registrants themselves, may use the above IC card, the ID, the password, and so on.

Replace the paragraph beginning at page 1, line 16, with:

On the other hand, Japanese Laid-Open Patent Publication No. 2000-76450 discloses an authentication device using unique fingerprints for each person which other persons may not use. The authentication device verifies the combination of the kinds of input fingerprints, and the order of input.

Replace the paragraph beginning at page 1, line 21, with:

In the authentication method according to the above authentication device, fingerprints are input a plurality of times and it is decided whether the input order is correct or not, in order to improve the confidence of authentication with a fingerprint. However, only a plurality of fingerprint inputs are performed, and, then, the degree of authentication accuracy has not been understood, though the confidence of authentication may be improved by the above method. In other words, when a certain degree of authentication accuracy is required, it has not been possible to estimate how many times the fingerprint input is required for securing the required authentication accuracy.

IN THE CLAIMS

Replace the indicated claims with:

1. (Amended) An authentication-selection system comprising:
 - a storage device storing a target-performance required for authenticating a person; and
 - an authentication-means selector which selects one from among a plurality of authentications and at least one combination of said authentication means satisfying the target-performance.

2. (Amended) The authentication-selection system according to Claim 1, further comprising:

a combination generator which generates a plurality of authentications and at least one combination of said authentication means; and

a calculator which calculates authentication performance for each of said plurality of authentications and the at least one combination of said authentication means.

3. (Amended) The authentication-selection system according to Claim 2, further comprising:

a target-performance setter which sets the target performance; and

a limiting-condition setter which sets a limiting condition for said authentication means, wherein

said combination generator generates the plurality of authentications and the at least one combination of said authentication means, based on the limiting condition; and

said authentication-means selector selects one among the plurality of authentications and the at least one combination of said authentication means, based on the limiting condition.

4. (Amended) The authentication-selection system according to Claim 3, wherein the limiting condition includes at least one of:

a plurality of kinds of said plurality of authentication means;

a priority in said plurality of kinds of said plurality of authentication means;

a combination of the plurality of authentications;

priority in the combinations of authentications;

number of the plurality of authentications for combination;

priority in the number of authentications for combination; and

number of candidate combinations.

5. (Amended) The authentication-selection system according to Claim 1, further comprising:

a performance storage device for storing authentication performance of said authentication means; and

a log-analyzer for analyzing log data which are authentication results of said authentication means, and for reflecting analysis results on the authentication performance of said authentication means.

7. (Amended) The authentication-selection system according to Claim 1, wherein the authentication performance of said authentication means includes at least one of:

a probability density function of a matching score indicating degrees of coincidence between input data and registration data in a case where a person is a registrant;

a numerical table;

a probability distribution; and

a parameter for approximation by a normal distribution.

8. (Amended) An authentication system comprising:

the authentication-selection system according to Claim 1 for selecting one among a plurality of authentications and at least one combination of the authentications; and

at least one of a plurality of authentication means for authenticating a person by verification of input data of persons with registration data, wherein authentication of a person is performed by said authentication selected or by the combination of the authentications selected.

9. (Amended) A selecting method for selecting one among a plurality of authentications and at least one combination of the authentications, the method comprising:

generating the at least one combination of the authentications using authentication means for authenticating a person;

calculating and storing authentication performance for each of said plurality of authentications and said at least one combination of authentications; and

selecting one among the plurality of authentications and of the at least one combination of the authentications, which meet target performance required for authentication.

10. (Amended) The authentication method according to claim 9, comprising:

generating at least one combination of the authentications, which is performed by said authentication means;

calculating and storing authentication performance for each of the plurality of authentications and the at least one combination of the authentications;

selecting one among the plurality of authentications and the at least one combination of the authentications, which meets target performance required for authentication; and

authenticating a person after verification of input data of the person with registration data in the authentication, or the combination of the authentications.

11. (Amended) An authentication-selection program executed on a computer, the program comprising the selecting method for selecting one among a plurality of authentications and at least one combination of the authentications according to Claim 9.

13. (Amended) An authentication program executed on a computer, the program comprising the authentication method according to Claim 10.

IN THE ABSTRACT

Replace the abstract with:

ABSTRACT OF THE DISCLOSURE

An authentication-selection system includes an authentication selector which selects one of several authentications and at least one combination of the authentications for authenticating a person. Preferably, a combination generator generates combinations of the authentications; and a calculator calculates authentication performance for each of the authentications and the combinations of the authentications. An authentication system includes the described elements and at least one authentication section for authenticating a person.

REMARKS

The foregoing amendments are made to correct minor translational errors and to meet United States requirements as to form. No new matter is added.

Respectfully submitted,

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**AMENDMENTS TO SPECIFICATION, CLAIMS, AND
ABSTRACT MADE VIA PRELIMINARY AMENDMENT**

Amendments to the paragraph beginning at page 1, line 8:

There have been various ~~kinds of~~ methods for security protection of important confidential matters by limiting ~~a~~ the number of persons ~~accessible with access~~ to the ~~above~~ these matters, and for checking persons entering a specific room. For example, use of an IC card, or input of an ID, a password and so on have been used as a method for the ~~above~~ authentication. However, the IC card, the ID, the password, and so on are not suitably used for more strict security protection, as even other persons, except the registrants themselves, may use the above IC card, the ID, the password, and so on.

Amendments to the paragraph beginning at page 1, line 16:

On the other hand, Japanese Laid-Open Patent Publication No. 2000-76450 discloses an authentication device using unique fingerprints for each person which other persons may not use. The authentication device verifies the combination of the kinds of input fingerprints, and the ~~orders~~ order of input.

Amendments to the paragraph beginning at page 1, line 21:

In the authentication method according to the above authentication device, fingerprints are input a plurality of times ~~of fingerprint inputs are performed~~ and it is also decided whether the input order is correct or not, in order to improve the confidentiality confidence of authentication with a fingerprint. However, only a plurality ~~of times~~ of fingerprint inputs are performed, and, then, the degree of authentication accuracy has not been understood, though the confidentiality confidence of authentication may be improved by the above method. In other words, when a certain degree of authentication accuracy is required, it has not been possible to estimate how many times ~~of the fingerprint inputs~~ input is required for securing the ~~above~~ required authentication accuracy.

Amendments to the existing claims:

1. (Amended) An authentication-selection system comprising:
 - a storage device storing ~~on~~ a target-performance required for authenticating a person; and
 - an authentication-means selector which selects one from among a plurality of ~~authentication authentications~~ and ~~at least one or more combinations~~ combination of said authentication means satisfying ~~said~~ the target-performance.
2. (Amended) The authentication-selection system according to Claim 1, further comprising:
 - a combination generator which generates a plurality of ~~authentication authentications~~ and ~~at least one or more combinations~~ combination of said authentication means; and
 - a calculator which calculates authentication performance for each of ~~said every~~ said plurality of ~~authentication authentications~~ and ~~said the at least~~ one ~~or more~~ combinations combination of said authentication means.

3. (Amended) The authentication-selection system according to Claim 1,
further comprising:

a target-performance setter which sets said the target performance; and

a limiting-condition setter which sets a limiting condition for said
authentication means, wherein

said combination generator generates said the plurality of authentication
authentications and said the at least one or more combinations combination of said
authentication means, based on said the limiting condition; and wherein

said authentication-means selector selects one among said the plurality
of authentication authentications and said the at least one or more combinations
combination of said authentication means, based on said the limiting condition.

4. (Amended) The authentication-selection system according to Claim 3,
wherein said at least one the limiting condition includes at least one of the following
items:

a plurality of kinds of said plurality of authentication means;

a priority in said plurality of kinds of said plurality of authentication means;

a combination of said the plurality of authentication authentications;

priority in said the combinations of authentications;

~~a number of~~ said the plurality of authentication authentications for
combination;

~~a number of~~ priority in the numbers number of said authentication authentications for
combination; and

~~a number of~~ candidate combinations.

5. (Amended) The authentication-selection system according to Claim 1,
further comprising:

a performance storage device for storing the authentication performance of said
authentication means; and

a log-analyzer for analyzing the log data which is are authentication result by
results of said authentication means, and for reflecting the analysis results on the
authentication performance of said authentication means.

7. (Amended) The authentication-selection system according to Claim 1, wherein the authentication performance of said authentication means includes at least one of ~~the following items:~~

a probability density function of a matching score indicating degrees of coincidence between input data and registration data in a case where a person is a registrant;

a numerical table;

a probability distribution; and

a parameter ~~in the case of~~ for approximation by a normal distribution.

8. (Amended) An authentication system comprising:

the authentication-selection system according to Claim 1 for selecting one among a plurality of ~~authentication~~ authentications and ~~at least one or more~~ combination of ~~said authentication~~ the authentications; and

at least one of a plurality of authentication means for authenticating a person by verification of input data of persons with registration data, wherein authentication of said a person is performed by ~~said selected~~ authentication selected or ~~said selected by~~ the combination of ~~said authentication~~ the authentications selected.

9. (Amended) A selecting method for selecting one among a plurality of ~~authentication~~ authentications and ~~at least one or more combinations~~ combination of ~~said authentication~~ the authentications, ~~said~~ the method comprising ~~the steps of~~:

generating ~~said~~ the ~~at least one or more~~ combination of ~~said authentication~~ the authentications using authentication means for authenticating a person;

calculating and storing authentication performance for each of said plurality of ~~authentication~~ authentications and ~~said at least one or more combinations~~ combination of ~~said authentication~~ authentications; and

selecting one among ~~said~~ the plurality of ~~authentication~~ authentications and ~~said of the at least one or more combinations~~ combination of ~~said authentication~~ the authentications, which ~~meets~~ meet target performance required for authentication.

10. (Amended) ~~An~~The authentication method according to claim 9,
comprising~~the steps of:~~

generating ~~at least one or more combinations~~ combination of ~~said authentication~~ the authentications, which is performed by said authentication means;

calculating and storing authentication performance for each of ~~said the~~ plurality of ~~authentication authentications~~ and ~~said the at least one or more~~ combination of ~~said authentication~~ the authentications;

selecting one among~~said the~~ plurality of ~~authentication authentications~~ and ~~said the at least one or more combinations~~ combination of ~~said authentication~~ the authentications, which meets target performance required for authentication; and

authenticating a person after verification of input data of ~~the~~ person with registration data ~~by said in the~~ authentication, or ~~said the~~ combination of ~~said authentication~~ the authentications.

11. (Amended) An authentication-selection program executed on a computer, ~~said the~~ program comprising the~~steps of~~ ~~said~~ selecting method for selecting one among a plurality of ~~authentication authentications~~ and ~~at least one or more combinations~~ combination of ~~said authentication~~ the authentications according to Claim 9.

13. (Amended) An authentication program executed on a computer, ~~said the~~ program comprising the~~steps of~~ ~~said~~ authentication method according to Claim 10.

Amendments to the abstract:

ABSTRACT OF THE DISCLOSURE

An authentication-selection system includes an authentication~~means~~ selector ~~26~~ which selects one ~~among a plurality of authentication~~ several authentications and ~~at least one or more combinations~~ combination of the ~~authentication~~, using ~~at least one of authentication means~~ authentications for authenticating a person. Preferably, a combination generator ~~24~~ for generating the ~~one or more~~ generates combinations of the ~~authentication~~ using at least one authentication means for authenticating person

authentications; and a calculator ~~25 for calculating~~ calculates authentication performance for each of the ~~plurality of authentication~~ authentications and the ~~one or more~~ combinations of the ~~authentication are further provided~~ authentications. An authentication system includes the ~~above authentication selection system described~~ elements and at least one authentication ~~means~~ ~~section~~ for authenticating a person. ~~Thereby, there is provided an authentication selection system for selecting one among the plurality of authentication and the one or more combinations of the authentication satisfying target performance required for authentication.~~

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PENDING CLAIMS AFTER ENTRY OF PRELIMINARY AMENDMENT

1. An authentication-selection system comprising:

a storage device storing a target-performance required for authenticating a person; and

an authentication-means selector which selects one from among a plurality of authentications and at least one combination of said authentication means satisfying the target-performance.

2. The authentication-selection system according to Claim 1, further comprising:

a combination generator which generates a plurality of authentications and at least one combination of said authentication means; and

a calculator which calculates authentication performance for each of said plurality of authentications and the at least one combination of said authentication means.

3. The authentication-selection system according to Claim 2, further comprising:

a target-performance setter which sets the target performance; and

a limiting-condition setter which sets a limiting condition for said authentication means, wherein

 said combination generator generates the plurality of authentications and the at least one combination of said authentication means, based on the limiting condition; and

 said authentication-means selector selects one among the plurality of authentications and the at least one combination of said authentication means, based on the limiting condition.

4. The authentication-selection system according to Claim 3, wherein the limiting condition includes at least one of:

- a plurality of kinds of said plurality of authentication means;
- a priority in said plurality of kinds of said plurality of authentication means;
- a combination of the plurality of authentications;
- priority in the combinations of authentications;
- number of the plurality of authentications for combination;
- priority in the number of authentications for combination; and
- number of candidate combinations.

5. The authentication-selection system according to Claim 1, further comprising:

 a performance storage device for storing authentication performance of said authentication means; and

 a log-analyzer for analyzing log data which are authentication results of said authentication means, and for reflecting analysis results on the authentication performance of said authentication means.

6. The authentication-selection system according to Claim 5, wherein said performance storage device stores authentication performance for each registrant.

7. The authentication-selection system according to Claim 1, wherein the authentication performance of said authentication means includes at least one of:

a probability density function of a matching score indicating degrees of coincidence between input data and registration data in a case where a person is a registrant;

a numerical table;

a probability distribution; and

a parameter for approximation by a normal distribution.

8. An authentication system comprising:

the authentication-selection system according to Claim 1 for selecting one among a plurality of authentications and at least one combination of the authentications; and

at least one of a plurality of authentication means for authenticating a person by verification of input data of persons with registration data, wherein authentication of a person is performed by said authentication selected or by the combination of the authentications selected.

9. A selecting method for selecting one among a plurality of authentications and at least one combination of the authentications, the method comprising:

generating the at least one combination of the authentications using authentication means for authenticating a person;

calculating and storing authentication performance for each of said plurality of authentications and said at least one combination of authentications; and

selecting one among the plurality of authentications and of the at least one combination of the authentications, which meet target performance required for authentication.

10. The authentication method according to claim 9, comprising:

generating at least one combination of the authentications, which is performed by said authentication means;

calculating and storing authentication performance for each of the plurality of authentications and the at least one combination of the authentications;

selecting one among the plurality of authentications and the at least one combination of the authentications, which meets target performance required for authentication; and

authenticating a person after verification of input data of the person with registration data in the authentication, or the combination of the authentications.

11. An authentication-selection program executed on a computer, the program comprising the selecting method for selecting one among a plurality of authentications and at least one combination of the authentications according to Claim 9.

12. A computer-readable recording medium including the authentication-selection program according to Claim 11.

13. An authentication program executed on a computer, the program comprising the authentication method according to Claim 10.

14. A computer-readable recording medium including the authentication program according to Claim 13.